SIMULATION OF INDUSTRIALISED BUILDING SYSTEM COMPONENTS PRODUCTION

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To my beloved family and fiancée

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ABSTRACT

The construction of IBS building starts with the production of the IBS components and the production process is the main activity concern in the IBS production plant. Having an optimum production line to manufacture the required IBS elements within targeted time and limited number of reusable steel mould is very important. In this study, workstation organization method has been adopted in the production of IBS beam and column. Witness 2001 simulation software has been used to model and simulate the most optimum production line set up. Basically, two production lines set up have been proposed to complete the production of IBS beam and column between two and three months time with limited number of reusable steel mould to supply for the construction of medium size single storey IBS housing project ranging from 100 to 300 units. A contingency production line set up which able to complete the production of required IBS components within a month time with increased number of reusable steel mould has also been proposed. Number of resources such as workstation, tool, storage area and labour has been determined from the proposal. The proposed production line can be applied in the planning and cost estimating of IBS production plant set up.

ABSTRAK

Pembinaan IBS bermula daripada operasi pembuatan komponen IBS di loji. Susunatur dan talian pengeluaran yang optima di sesebuah loji adalah penting dalam menghasilkan komponen IBS dalam masa yang tertentu serta dengan bilangan acuan yang terhad. Dalam kajian ini, kaedah pembuatan yang diaplikasikan ialah kaedah pengkhususan dan jumlah bilangan komponen IBS yang perlu dihasilkan adalah berdasarkan projek sederhana dalam lingkungan 100 hingga 300 rumah satu tingkat yang menggunakan komponen IBS sepenuhnya dalam pembinaan. Perisian komputer Witness 2001 telah digunakan untuk kerja memodel dan simulasi untuk menentukan talian pengeluaran yang optima. Terdapat dua cadangan talian pengeluaran yang berupaya untuk menghasilkan bilangan komponan rasuk dan tiang IBS dengan bilangan acuan yang terhad dalam masa dua dan tiga bulan untuk memenuhi keperluan projek sederhana. Selain itu, talian pengeluaran yang dapat menghasilkan komponen IBS yang diperlukan dalam masa satu bulan dengan peningkatan bilangan acuan turut dicadangkan. Bilangan mesin, peralatan, tenaga perkerja dan tempat simpanan sementara turut ditentukan berdasarkan talian pengeluaran yang dicadangkan. Perancangan dan penganggaran kos penubuhan loji pembuatan komponen IBS dilakukan berlandaskan cadangan talian pengeluaran tersebut.